IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Hanafy Meleis

Serial No.: 09/910,555

Filed: July 20, 2001

For: NETWORK MODELS, METHODS, AND COMPUTER PROGRAM PRODUCTS FOR MANAGING A SERVICE INDEPENDENT OF THE UNDERLYING NETWORK TECHNOLOGY

Examiner: Dhairya A. Patel

Group Art Unit: 2151

Confirmation No.: 3472

Date: June 30, 2006

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION--37 C.F.R. § 1.192)

1.   Transmitted herewith is the APPEAL BRIEF for the above-identified application, pursuant to the Notice of Appeal filed in US Patent and Trademark Office on **June 30, 2006.**

2.   Pursuant to 37 C.F.R. § 1.17(c), the fee for filing the Appeal Brief is:

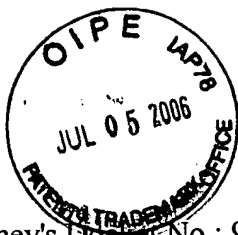☐ small entity $250.00

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3.   ☒   Any additional fee or refund may be charged to Deposit Account 50-0220.

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<div align="right">PATENT</div>

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APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. §41.37

Sir:

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed June 30, 2006.

Real Party In Interest

The real party in interest is assignee Trendium, Inc., Fort Lauderdale, Florida.

Related Appeals and Interferences

Appellant is aware of no appeals or interferences that would be affected by the present appeal.

Status of Claims

Appellant appeals the final rejection of Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 - 26, which as of the filing date of this Brief remain under consideration. The claims at issue as included in Appellant's response to the Office Action of October 19, 2005 are attached hereto as Appendix A.

Status of Amendments

Three responses have been filed in the present case: An "Amendment" was filed January 21, 2005 in response to an Office Action mailed October 21, 2004. A "Request for Reconsideration" was filed July 27, 2005 in response to an Office Action mailed April 27, 2005. A "Request for Reconsideration" was filed January 19, 2006 in response to an Office Action mailed October 19, 2005. The rejections were maintained in a Final Office Action mailed April 3, 2005 (hereinafter "Final Action"). Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 – 26 remain for consideration on the present appeal.

Summary of Claimed Subject Matter

Appellant appeals the final rejection of Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 – 26.

Independent Claim 1 is directed to a network model for managing a service comprising an end service domain (ESD 22 of FIG. 1) that associates the service with an end service provider. The end service domain comprises a plurality of wholesale service domains (Core WSDs 26* and Access WSDs 28* of FIG. 1) in which respective ones of the wholesale service domains comprise at least one network that provides traffic transport for the end service domain. The network model further comprises a plurality of gateways (Gateways 32* of FIG. 1) in which a first one of the plurality of gateways (Gateway 32c, for example, of FIG. 1) couples one of the plurality of wholesale service domains to another one of the wholesale service domains and is configured to perform protocol translation on traffic passing between wholesale service domains. A second one of the plurality of gateways (Gateway 32a, for example, of FIG. 1) is configured to couple a user to the end service domain and is further configured to communicate with the user by a protocol associated with the service. The network model further comprises a process domain (Process Domain 34 of FIG. 1) that provides an abstract representation of applications provided by the end service domain. A service management system (Service Management System 24 of FIG. 1) is communicatively coupled to the end service domain. The service management system comprises a plurality of software objects that represent resources in the end service domain for providing the service (Mediation Facilities module 86 of FIG. 3). A policy database (Data 92 of FIG. 3) comprises rules (Policy Rules 94 of FIG. 3) for associating

requirements of the service with resources in the end service domain. (*See also*, Specification, page 5, line 14 through page 10, line 32).

Independent Claim 6 is directed to a method of managing a service comprising providing an end service domain (ESD 22 of FIG. 1) that comprises a plurality of resources that facilitate delivery of the service. A service model (Virtual Service Model 104 of FIG. 5) is generated that comprises a plurality of virtual processes (Virtual Processes 112 of FIG. 5) and a plurality of virtual connections (Virtual Connections 108 of FIG. 5) from the end service domain that are associated with the service. Information is obtained that specifies capabilities of the plurality of resources in the end service domain (Resource Capabilities Database 96 of FIG. 3). A policy database (Policy Rules Database 94 of FIG. 3) is provided that comprises rules for associating requirements of the service with the plurality of resources. The plurality of virtual processes and the plurality of virtual connections are assigned to ones of the plurality of resources based on the information that specifies the capabilities of the plurality of resources and the policy database (Block 114 of FIG. 4). (*See also*, Specification, page 12, line 4 through page 13, line 8).

Independent Claim 13 is directed to a method of managing a service comprising means for providing an end service domain (ESD 22 of FIG. 1) that comprises a plurality of resources that facilitate delivery of the service, means for generating a service model (Virtual Service Model 104 of FIG. 5) that comprises a plurality of virtual processes (Virtual Processes 112 of FIG. 5) and a plurality of virtual connections (Virtual Connections 108 of FIG. 5) from the end service domain that are associated with the service, means for obtaining information that specifies capabilities of the plurality of resources (Resource Capabilities Database 96 of FIG. 3) in the end service domain, means for providing a policy database (Policy Rules Database 94 of FIG. 3) that comprises rules for associating requirements of the service with the plurality of resources, and means for assigning the plurality of virtual processes and the plurality of virtual connections to ones of the plurality of resources based on the information that specifies the capabilities of the plurality of resources and the policy database (Block 114 of FIG. 4). The ESD 22 of FIG. 1 provides structure for the means for providing an end service domain. The virtual service model 104 of FIG. 5 along with the processor 72 and memory 74 of FIG. 3 provide structure for the means for generating a service model. The processor 72, memory 74, and resource capabilities database 96 of FIG. 3 provide structure for the means for obtaining

information. The processor 72, memory 74, and policy rules database 94 provide structure for the means for providing a policy database. The processor 72 and memory 74 of FIG. 3 and the block 114 of FIG. 4 provide structure for the means for assigning.

Independent Claim 20 is directed to a computer program product for managing a service comprising a computer readable storage medium having computer readable program code embodied therein (Memory 74 of FIG. 3). The computer readable program code comprises computer readable program code configured to provide an end service domain (ESD 22 of FIG. 1) that comprises a plurality of resources that facilitate delivery of the service, computer readable program code configured to generate a service model (Virtual Service Model 104 of FIG. 5) that comprises a plurality of virtual processes (Virtual Processes 112 of FIG. 5) and a plurality of virtual connections (Virtual Connections 108 of FIG. 5) from the end service domain that are associated with the service, computer readable program code configured to obtain information that specifies capabilities of the plurality of resources (Resource Capabilities Database 96 of FIG. 3) in the end service domain, computer readable program code configured to provide a policy database (Policy Rules Database 94 of FIG. 3) that comprises rules for associating requirements of the service with the plurality of resources, and computer readable program code configured to assign the plurality of virtual processes and the plurality of virtual connections to ones of the plurality of resources based on the information that specifies the capabilities of the plurality of resources and the policy database (Block 114 of FIG. 4).

Grounds of Rejection to be Reviewed on Appeal

Independent Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 - 26 stand rejected under 35 U.S.C. §103(a) as being as being unpatentable over U. S. Patent No. 6,012,088 to Li et al. (hereinafter "Li") in view of U. S. Patent No. 6,487,594 to Bahlmann (hereinafter "Bahlman").

Argument

I.   Introduction to 35 U.S.C. §103 Analysis

A determination under §103 that an invention would have been obvious to someone of ordinary skill in the art is a conclusion of law based on fact. *Panduit Corp. v. Dennison Mfg. Co.*

810 F.2d 1593, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987), *cert. denied*, 107 S.Ct. 2187. After the involved facts are determined, the decision maker must then make the legal determination of whether the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time the invention was unknown, and just before it was made. *Id.* at 1596. The United States Patent and Trademark Office (USPTO) has the initial burden under §103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

To establish a prima facie case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. M.P.E.P. §2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. §2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be **clear and particular**, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In another decision, the Court of Appeals for the Federal Circuit has stated that, to support combining or modifying references, there must be **particular** evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

Appellant respectfully submits that the pending independent claims are patentable over the cited references for at least the reason that the cited references do not disclose or suggest each of the recitations of the independent claims. The patentability of the pending claims is discussed in detail hereinafter.

A.   **Independent Claims 1, 6, 13, and 20 are Patentable over Jorgenson**

Independent Claims 1, 6, 13, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Li in view of Bahlmann. Claim 1, for example, is directed to a network model for managing a service and recites, in part:

> an end service domain that associates the service with an end service provider, the end service domain comprising:
> a plurality of wholesale service domains, respective ones of the plurality of wholesale service domains comprising at least one network that provides traffic transport for the end service domain;
> **a plurality of gateways,** wherein at least a first one of the plurality of gateways couples one of the plurality of wholesale service domains to another one of the wholesale service domains and is **configured to perform protocol translation on traffic passing between the coupled wholesale service domains,** and wherein at least a second one of the plurality of gateways is configured to couple a user to the end service domain and is further configured to communicate with the user by a protocol associated with the service;
> **a process domain that provides an abstract representation of applications provided by the end service domain;**
> a service management system that is communicatively coupled to the end service domain, the service management system comprising:
> **a plurality of software objects that represent resources in the end service domain for providing the service; and**
> **a policy database that comprises rules for associating requirements of the service with resources in the end service domain.** (Emphasis added).

Claims 6, 13, and 20 include similar recitations. The Final Action alleges that Li discloses all of the recitations of independent Claim 1 except for the policy database recitation, which is alleged to be disclosed by Bahlmann. (Final Action, page 4). Appellant respectfully disagrees and submits that the combination of Li and Bahlmann fail to disclose or suggest, at least, the highlighted recitations of independent Claim 1 and analogous recitations in independent Claims 6, 13, and 20.

For example, independent Claim 1 recites "a plurality of gateways...configured to perform protocol translation on traffic passing between the coupled wholesale service domains." The Final Action alleges that point of presence (POP) element 42 of FIGS. 2 - 4 of Li corresponds to a gateway recited in independent Claim 1. (Final Action, page 3). According to Claim 1, however, at least one of the plurality of gateways is configured to perform protocol translation. As shown in FIG. 3 of Li, the POP element 42 does not include any component or

module that would allow it to perform protocol translation. Thus, Appellant submits that Li fails to disclose or suggest the plurality of gateways recited in independent Claim 1.

In response to this argument, the Final Action asserts that Li teaches protocol translation in column 8, lines 14 - 35 because this passage makes reference to an IP routing/address translation module 240. (Final Action, page 9). The discussion in column 8, lines 14 - 35 pertains to the software architecture 200 of the Internet access device 100 of FIG. 5 (Li, col. 8, lines 5 - 13)--not the POP element 42. Appellant submits that a POP element 42 as disclosed in Li is an access point for the Internet, not a gateway that provides protocol translation for coupling separate domains.

Claim 1 further recites "a process domain that provides an abstract representation of applications provided by the end service domain." The Final Action alleges that Li discloses this recitation at col. 6, lines 13 - 16 (Final Action, page 3), which state:

> A typical POP contains a distribution router 62 connected to a local area network
> 64 that distributes information among various servers and various hardware
> interfaces for outside communication to Internet customers.

Appellant respectfully submits that a router that routes information among servers and hardware interfaces is not "a process domain that provides an abstract representation of applications." Li does not contain any information explaining that the information routed via the distribution router 62 is an "abstract representation of applications." Thus, Appellant submits that Li fails to disclose or suggest the process domain recited in independent Claim 1.

In response to this argument, the Final Action asserts that Li teaches providing an abstract representation of application provided by an end service domain in col. 8, line 5 through col. 9, line 9. (Final Action, page 9). As discussed above, this passage of Li is a description of the software architecture of the Internet access device 100 of FIG. 5. (Li, col. 8, lines 5 - 13). The various applications cited in the Final Action, e.g., an email server, FTP daemon, Web server for viewing and accessing Web pages, which are shown in FIG. 6 are not an "an abstract representation of applications provided by an end service domain" as recited in independent Claim 1. Instead, these are actual applications used to provide the particular service. For example, Li explains that the email server 212 provides email service (Li, col. 8, line 36) and the

FTP daemon provides file storage and transfer using industry standard protocols (Li, col. 8, lines 38 - 41). Appellant submits, therefore, that the software modules shown in FIG. 6 of Li for the Internet access device 100 are not abstract representations of applications provided by another entity, such as an end service domain, but are instead software components used to provide functionality and operability for the Internet access device 100.

Claim 1 further recites "a plurality of software objects that represent resources in the end service domain for providing the service." The Final Action alleges that Li discloses this recitation at col. 5, lines 30 - 38, which explains that IP network 30 may be one of many IP networks that are managed by an Internet Service Provider (ISP) via a network operation center 40. While Appellant acknowledges that the IP network(s) contains many elements and resources to be monitored, Appellant submits that Li does not provide any disclosure or suggestion that the ISP includes software objects that **represent** the resources in the IP network(s). Thus, Appellant submits that Li fails to disclose or suggest the plurality of software objects recited in independent Claim 1.

In response to this argument, the Final Action cites the passage of Li at col. 8, line 5 through col. 9, line 9 related to the software architecture of the Internet Access Device 100 (Li, col. 8, lines 5 - 13) (Final Action, page 9). Appellant respectfully submits that the various functional software components shown in FIG. 6 for an Internet access device 100 are not related to software objects that represent resources in an end service domain. The Internet access device 100 uses the Internet and is not involved in managing resources that comprise the Internet. Appellant submits, therefore, that the software modules shown in FIG. 6 of Li for the Internet access device 100 are not representations of resources in another entity, such as an end service domain, but are instead software components used to provide functionality and operability for the Internet access device 100. Moreover, as noted in Li at col. 5, lines 30 -38, an ISP may manage one or more IP networks, but Li is silent as to the particular architecture and methods used to perform such management.

Claim 1 further recites "a policy database that comprises rules for associating requirements of the service with resources in the end service domain." The Final Action cites the central policy database 12 shown in FIG. 1 of Bahlmann as corresponding to the policy database recited in Claim 1. (Final Action, page 4). Appellant acknowledges that the central policy

database 12 and regional policy database 14 described in Bahlmann include business rules, applications, and data used to provision network equipment. (*See, e.g.*, Bahlmann, col. 3, lines 5 - 40). Appellant submits, however, that Bahlmann does not appear to include any disclosure or suggestion of including rules that associate **requirements of a service** with the network resources. Thus, Appellant submits that Bahlmann fails to disclose or suggest the policy database recited in independent Claim 1.

In response to this argument, the Final Action states that "Bahlman clearly teaches having business rules and policies which describes the control and the infrastructure (components) in a real database for the infrastructure elements." (Final Action, page 9). Appellant agrees that the central policy database 12 disclosed in Bahlman contains control and infrastructure information for network elements. Bahlman provides details on this provisioning information at col. 3, lines 26 - 40. Appellant respectfully submits, however, that Bahlman does not appear to include any disclosure or suggestion that central policy database 12 further includes rules in which requirements of a service are associated with the network element. Instead, the central policy database 12 appears to include only technical configurations and policies for provisioning network elements, such that the network elements work properly with other provisioned equipment.

For at least the foregoing reasons, Appellant submit that Claims 1, 6, 13, and 20 are patentable over the cited references and that dependent Claims 3 - 5, 8 - 12, 15 - 19, and 22 - 26 are patentable at least by virtue of their depending from an allowable claim. Accordingly, Appellants respectfully request that the rejection of Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 – 26 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons.

II.   Conclusion

In summary, Appellants respectfully submit that, with respect to Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 – 26, the cited references do not teach all of the recitations of the claims for at least

the reasons discussed above. Accordingly, Appellants respectfully request reversal of the

rejection of Claims 1, 3 – 6, 8 – 13, 15 – 20, and 22 – 26 based on the cited references.

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APPENDIX A

1.   (Previously presented) A network model for managing a service, comprising:
an end service domain that associates the service with an end service provider, the end service
domain comprising:

a plurality of wholesale service domains, respective ones of the plurality of wholesale
service domains comprising at least one network that provides traffic transport for the end
service domain;

a plurality of gateways, wherein at least a first one of the plurality of gateways couples
one of the plurality of wholesale service domains to another one of the wholesale service
domains and is configured to perform protocol translation on traffic passing between the coupled
wholesale service domains, and wherein at least a second one of the plurality of gateways is
configured to couple a user to the end service domain and is further configured to communicate
with the user by a protocol associated with the service;

a process domain that provides an abstract representation of applications provided by the
end service domain;

a service management system that is communicatively coupled to the end service domain,
the service management system comprising:

a plurality of software objects that represent resources in the end service domain for
providing the service; and

a policy database that comprises rules for associating requirements of the service with
resources in the end service domain.

2.   (Canceled)

3.   (Previously presented) The network model of Claim 1, wherein the requirements
of the service comprises:

service requirements associated with the user.

4.   (Original) The network model of Claim 1, wherein the first one of the plurality of gateways is further configured to set up internal connections in the one of the plurality of wholesale service domains.

5.   (Original) The network model of Claim 1, wherein the second one of the plurality of gateways is further configured to analyze incoming user traffic and to segregate the incoming user traffic according to application.

6.   (Previously presented) A method of managing a service, comprising:

providing an end service domain that comprises a plurality of resources that facilitate delivery of the service;

generating a service model that comprises a plurality of virtual processes and a plurality of virtual connections from the end service domain that are associated with the service;

obtaining information that specifies capabilities of the plurality of resources in the end service domain;

providing a policy database that comprises rules for associating requirements of the service with the plurality of resources; and

assigning the plurality of virtual processes and the plurality of virtual connections to ones of the plurality of resources based on the information that specifies the capabilities of the plurality of resources and the policy database.

7.   (Canceled)

8.   (Previously presented) The method of Claim 6, wherein the requirements of the service comprises:

service requirements associated with the user.

9.   (Previously presented) The method of Claim 6, wherein generating the service model comprises:

identifying service points in the end service domain corresponding to at least one resource through which a user accesses the service and at least one resource that hosts an end service domain application.

10. (Original) The method of Claim 9, wherein the end service domain comprises:

a plurality of wholesale service domains, respective ones of the plurality of wholesale service domains comprising at least one network that provides traffic transport for the end service domain; and

a plurality of gateways, wherein at least a first one of the plurality of gateways couples one of the plurality of wholesale service domains to another one of the wholesale service domains and is configured to perform protocol translation on traffic passing between the coupled wholesale service domains, and wherein at least a second one of the plurality of gateways is configured to couple a user to the end service domain and is further configured to communicate with the user by a protocol associated with the service.

11. (Original) The method of Claim 10, further comprising:

associating respective ones of the plurality of virtual connections with respective ones of a plurality of ordered lists of the gateways that define routes through the end service domain.

12. (Original) The method of Claim 11, further comprising:

associating respective ones of the plurality of virtual connections with respective ones of a plurality of routes within the wholesale service domains.

13. (Previously presented) A system for managing a service, comprising:

means for providing an end service domain that comprises a plurality of resources that facilitate delivery of the service;

means for generating a service model that comprises a plurality of virtual processes and a plurality of virtual connections from the end service domain that are associated with the service;

means for obtaining information that specifies capabilities of the plurality of resources in the end service domain;

means for providing a policy database that comprises rules for associating requirements of the service with the plurality of resources; and

means for assigning the plurality of virtual processes and the plurality of virtual connections to ones of the plurality of resources based on the information that specifies the capabilities of the plurality of resources and the policy database.

14. (Canceled)

15. (Previously presented) The system of Claim 13, wherein the requirements of the service comprises:

service requirements associated with the user.

16. (Previously presented) The system of Claim 13, wherein the means for generating the service model comprises:

means for identifying service points in the end service domain corresponding to at least one resource through which a user accesses the service and at least one resource that hosts an end service domain application.

17. (Original) The system of Claim 16, wherein the end service domain comprises:

a plurality of wholesale service domains, respective ones of the plurality of wholesale service domains comprising at least one network that provides traffic transport for the end service domain; and

a plurality of gateways, wherein at least a first one of the plurality of gateways couples one of the plurality of wholesale service domains to another one of the wholesale service domains and is configured to perform protocol translation on traffic passing between the coupled wholesale service domains, and wherein at least a second one of the plurality of gateways is configured to couple a user to the end service domain and is further configured to communicate with the user by a protocol associated with the service.

18. (Original) The system of Claim 17, further comprising:

means for associating respective ones of the plurality of virtual connections with respective ones of a plurality of ordered lists of the gateways that define routes through the end service domain.

19.   (Original) The system of Claim 18, further comprising:

means for associating respective ones of the plurality of virtual connections with respective ones of a plurality of routes within the wholesale service domains.

20.   (Previously presented) A computer program product for managing a service, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code for providing an end service domain that comprises a plurality of resources that facilitate delivery of the service;

computer readable program code for generating a service model that comprises a plurality of virtual processes and a plurality of virtual connections from the end service domain that are associated with the service;

computer readable program code for obtaining information that specifies capabilities of the plurality of resources in the end service domain;

computer readable program code for providing a policy database that comprises rules for associating requirements of the service with the plurality of resources; and

computer readable program code for assigning the plurality of virtual processes and the plurality of virtual connections to ones of the plurality of resources based on the information that specifies the capabilities of the plurality of resources and the policy database.

21.   (Canceled)

22.   (Previously presented) The computer program product of Claim 20, wherein the requirements of the service comprises:

service requirements associated with the user.

23.   (Previously presented) The computer program product of Claim 20, wherein the computer readable program code for generating the service model comprises:

computer readable program code for identifying service points in the end service domain corresponding to at least one resource through which a user accesses the service and at least one resource that hosts an end service domain application.

24.   (Original) The computer program product of Claim 23, wherein the end service domain comprises:

a plurality of wholesale service domains, respective ones of the plurality of wholesale service domains comprising at least one network that provides traffic transport for the end service domain; and

a plurality of gateways, wherein at least a first one of the plurality of gateways couples one of the plurality of wholesale service domains to another one of the wholesale service domains and is configured to perform protocol translation on traffic passing between the coupled wholesale service domains, and wherein at least a second one of the plurality of gateways is configured to couple a user to the end service domain and is further configured to communicate with the user by a protocol associated with the service.

25.   (Original) The computer program product of Claim 24, further comprising:

computer readable program code for associating respective ones of the plurality of virtual connections with respective ones of a plurality of ordered lists of the gateways that define routes through the end service domain.

26.   (Original) The computer program product of Claim 25, further comprising:

computer readable program code for associating respective ones of the plurality of virtual connections with respective ones of a plurality of routes within the wholesale service domains.

APPENDIX B – EVIDENCE APPENDIX

None

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APPENDIX C – RELATED PROCEEDINGS APPENDIX

None.